REMARKS/ARGUMENTS

The Office Action mailed November 15, 2005 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Claim Status and Amendment to the Claims

Claims 1-16 are now pending. No claims stand allowed.

New claims 14-16 have been added, which also particularly point out and distinctly claim subject matter regarded as the invention. Support for these claims may be found in the specification, page 10, lines 28-31, and in original Claim 9.

The 35 U.S.C. §103 Rejections

Claims 1- 4, 7-9, and 11-13 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Jeromin (U.S. Pat. No. 5,381,014) in view of Gale (U.S. Pat. No. 4,585,513), among which claims 1, 2 and 11 are independent claims. In addition, Claims 5-6 and 10 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Jeromin in view of Gale further in view of the admitted prior art or Mori (U.S. Pat. No. 4,591,984).

The rejections are respectfully traversed.

According to M.P.E.P. §2143,

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The

> teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

Furthermore, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Claim 1 defines an X-radiation imagery device comprising at least one detection matrix made of a semiconducting material. The detection matrix comprises (a) pixels to convert incident X-photons into electric charges, (b) an electric charges reading panel including a plurality of electronic devices, each electronic device being integrated by pixel, the electric charges reading panel being a monocrystalline silicon panel, and (c) a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, as recited in Claim 1.

In the Office Action, the Examiner alleges that the elements of the presently claimed invention are disclosed in Jeromin except that Jeromin does not teach that the electric charges reading panel is made of monocrystalline silicon. The Examiner further alleges that Gale discloses a conventional single crystalline silicon substrate or electric charges reading panel. The Examiner specifically states as follows:

> ... Gale discloses a conventional single crystalline silicon substrate or electric charges reading panel (citing column 2, lines 23-28). One of ordinary skill in the art would be motivated to use the substrate or electric charges reading panel as disclosed by Gale with the invention as disclosed by Jeromin as single crystalline silicon has greater detection efficiency than selenium as disclosed by Jeromin. Further, one of the ordinary skill in the art would be motivated to use the detection material

> as disclosed by Gele with the invention as disclosed by Jeromin as silicon is well known and well studied imager material, thus use of such material would decrease the difficulty of mass manufacturing.

Thus, the Examiner essentially alleges that it would have been obvious to combine Gale's single crystalline silicon substrate **24** so as to replace Jeromin's dielectric (glass) substrate **15** having pixels **19** (i.e., the alleged "electric charges reading panel including a plurality of electronic devices") with Gale's single crystalline silicon substrate **24** to obtain the claimed invention. The Applicants respectfully disagree for the reasons set forth below.

Jeromin describes a large area X-ray imager having a dielectric (glass) substrate **15**, on which transistor-capacitor pixels **19** and a radiation detecting layer **14** are formed (see Abstract, FIG. 1 thereof).

Gale allegedly discloses a CCD imager **22** including a thin single crystalline silicon substrate **24** having a CCD imager formed along one surface **26** thereof, and a support **28** made of a transparent material, such as glass, on the other surface **30** (column 2, lines 32-36, FIG. 1 thereof). The silicon substrate **24** is adhered to a backing plate **34** by an adhesive layer **35** (column 2, lines 30-60, Fig. 6 of Gale). Gale also describes the method for removing the portion of the glass support **28** exposed through the housing window **18** to form an opening (see FIGS. 1-3 and 6, column 1, lines 5-8, and column 2, lines 54-65). Furthermore, Gale teaches an etching process for the glass removal using a specific apparatus **40** which moves/rotates the CCD imager assembly **10** placed in a

container **42** containing etchant (see FIG. 5, column 3, line 60 through column 4, line 25 thereof).

However, such an etching process is only feasible for a small CCD imagers, and thus is not suitable to realize large digital imagers such as X-radiation imagery devices. Thus, Gale dissuade one of ordinary skill in the art from applying teaching of Gale to a large area X-ray imager of Jeromin. The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination. *Hodosh v. Block Drug Co., Inc.,* 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Gale lacks any of such suggestions or desirability to combine a small-sized, thin semiconductor substrate **24** with Jeromin's large area X-ray imager replace Jeromin's glass substrate.

In addition, the Examiner's allegation that "'single crystalline silicon has greater detection efficiency than selenium as disclosed by Jeromin' to replace Jeromin's glass substrate **15** with Gale's monocrystalline silicon substrate **24**" does not provide the alleged motivation to combine Gale with Jeromin, because Jeromin uses selenium for the radiation detecting layer **14**, not for the glass substrate **15** (the alleged electric charges reading panel). Thus, according to the alleged motivation, one of ordinary skill in the art would replace Jeromin's radiation detecting layer **14** with Gale's silicon substrate **24**,

which results in an imager having a glass substrate **15** as the alleged electric charged reading panel with a detecting layer made of monocrystalline semiconductor substrate. Thus, the Examiner fails to allege required motivation to maintain the §103 rejection.

Accordingly, none of the references provides the motivation or desirability of the alleged combination, and even if Jeromin and Gale should be combined in accordance with the Examiner's allegation, such a combination would not yield the claimed invention.

Claims 2 and 11, as well as new claims 14 and 16, also include substantially the same distinctive feature as claim 1.

Accordingly, it is respectfully requested that the rejection of claims based on Jeromin an Gale withdrawn. In view of the foregoing, it is respectfully asserted that the claims are now in condition for allowance.

Dependent Claims

Claims 3-6 depend from claim 2, claims 7-10 depend from claim 1, and claims 12-13 depend from claim 11, thus include the limitations of claims 2, 1 and 11, respectively. The argument set forth above is equally applicable here. The base claims being allowable, the dependent claims must also be allowable at least for the same reasons.

Regarding New Claims

In the present invention, each pixel integrates an electronic device ("integrated pixel"), which includes an amplifier, a processing circuit, and the like (see page 10, lines 26-31 of the present specification). On the other hand, in Jeromin, each pixel **19** only includes a transistor and a capacitor, as illustrated in FIG. 2 thereof, and does not include an amplifier. This is because, in Jeromin, a charge amplifying detector **36** is provided outside of the pixel **19** (column 5, lines 29-31, see FIGS. 2-3 thereof). In Gale, similarly to a conventional CCD imager, the single crystalline silicon substrate **24** has three sections: A-register (photo-sensing array), B-register (temporary storage array), and C-register (output register). The light being detected passes through the substrate **24** from the back surface of the substrate **24** to the A-register (column 1, lines 12-60, Fig. 6 thereof). There is no amplifying function in these registers. Thus, Gale's semiconductor substrate **24** does not include an amplifier or processing circuit therein.

Accordingly, neither Gale nor Jeromin teaches or suggests "integrated" pixels formed on the crystalline silicon substrate, and thus the alleged combination of Gale with Jeromin would also fail to teach or suggest the claimed electric charged reading panel in which each electronic device including an amplifier, as recited in claims 14 and 16.

In view of the foregoing, it is respectfully asserted that claims 14 and 16 have an additional ground to be placed them in condition for allowance.

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

Request for Interview

Applicants respectfully request an interview to expedite the prosecution of this application. Submitted herewith is an Applicant Initiated Interview Request Form. The Examiner is invited to call the undersigned attorney at the number indicated below to schedule a telephonic interview to discuss the matter.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-1698.

Respectfully submitted,
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